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Docket No. DE030412

REMARKS

I.   INTRODUCTION

Claims 1, 2, 8, and 9 have been amended. Support for these amendments can be found at least at page 9, lines 7-26 of the originally filed application. Thus, claims 1-10 remain pending in the present application. No new matter has been added. Applicants would like to thank the Examiner for indicating that claims 2-6 contain allowable subject matter. In view of the above amendments and the following remarks, however, Applicants respectfully submit that all presently pending claims are in condition for allowance.

II.   THE 35 U.S.C. § 112 REJECTION SHOULD BE WITHDRAWN

Claims 1-10 stand rejected under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement. Specifically, the Examiner states that the recitation of "the registering including selecting at least one further first landmark in the first image and at least one further second landmark in the second image" is not supported by the specification. (*See* 12/16/10 Office Action, p. 2).

The Examiner asserts that the specification only provides support only for selecting at least one further landmark in the second image, but not the first. (*Id.* at p. 3). Applicants respectfully disagree and direct the Examiner's attention to page 7, lines 24-27 of the originally filed application. This portion of the specification explains that after the images to be registered are acquired, a plurality "of significant landmarks $\{L_i\}$ is selected in **both** images A and B, which can be unambiguously assigned or allotted to each other, i.e. which unambiguously correspond to each other." So, it is clear that when a landmark is added to one image, a corresponding landmark may be added to the other image. A similarity value S signifies the similarity of a simplex $\{P_i\}$ in the floating image A to the reference image B. (*See* Specification, p. 9, ll. 7-12). Applicants respectfully submit that one of ordinary skill in the art would understand that if at least one further landmark is registered in one image, a corresponding at least one further landmark may be registered in the other image so that the similarity S between the new

simplex can be determined. Accordingly, the withdrawal of this rejection is respectfully requested.

III.   THE 35 U.S.C. § 102(b) REJECTIONS SHOULD BE WITHDRAWN

Claims 1 and 8-10 stand rejected under 35 U.S.C. § 102(b) as anticipated by Pardas et al. (U.S. Published App. No. 2003/0048955).

Claim 1, as amended, recites, "[a] method of registering a first image and a second image, the method comprising the steps of: selecting, by an image processing device, at least one first landmark in the first image; selecting, by an image processing device, at least one second landmark in the second image, wherein the at least one first landmark corresponds to the at least one second landmark; and registering, by an image processing device, the first and second images by using a similarity value which relates to a similarity of a first region in the first image determined by the at least one first landmark and a second region in the second image determined by the at least one second landmark, *the registering including selecting at least one further first landmark in the first image and at least one further second landmark in the second image if the similarity value is less than a pre-selected value*."

Pardas discloses a method for coding a sequence of pictures using an active triangular mesh coding scheme and a partition tree. (*See* Pardas, Abstract). The method of Pardas begins with a block mesh whose mesh elements are subsequently divided into two triangles. (*Id.* at ¶ [0050]). Pardas discloses that new triangles must either be introduced (segmentation 141) or removed (merging 142) because of modifications of the scene content. (*Id.* at ¶ [0056]). There are two criteria used to determine which triangles should be segmented in the segmentation step (141). The first is that one new edge of the triangle should follow the high gradient if a high gradient component of the signal crosses one of the triangle's edges. The second criterion is that a large triangle should be segmented into smaller triangles since the large triangle would most likely produce synthesis errors. (*Id.* at ¶ [0057]). The merging step (142) removes triangles that are either small or degenerated. (*Id.* at ¶ [0058]).

The Examiner refers to a reproduced version of Figure 20 of Pardas to meet the recitations of claim 1. (*See* 12/16/10 Office Action, pp. 4-5). Applicants respectfully disagree with the Examiner's interpretation of Pardas and of Figure 20. Figure 20 merely displays the set of mesh proposals from the original projected mesh. (*See* Pardas, ¶ [0067], Fig. 20). There are five levels in Figure 20. The original projected mesh is the displayed at the middle level. Segmentation is displayed descending from the middle level. Merging is displayed ascending from the middle level. (*Id.* at ¶ [0067]). So, the two levels above the original projected mesh in the middle level are subsequent levels of the merging step. In the level directly above the original projected mesh, the two mesh elements at the right have been merged, resulting in one big element on the right and two smaller ones on the left. (*Id.*). The uppermost level is the result of a further merging step, which merges the remaining two elements that were on the left in the preceding level. So, the different levels in this figure are NOT different images. They are the same image, but after merging or segmentation. Accordingly, Pardas fails to disclose or suggest "registering, by an image processing device, the first and second images by using a similarity value which relates to a similarity of a first region in the first image determined by the at least one first landmark and a second region in the second image determined by the at least one second landmark," as recited in claim 1.

Furthermore, the Examiner refers to the two criteria for choosing which triangles should be segmented in segmenting step (141) to meet the recitation of the pre-selected value. (*See* 12/16/10 Office Action, p. 4). Applicants respectfully disagree. The claimed pre-selected value is a value of the recited "similarity value." Pardas' two criteria are not values. Even if Pardas did disclose a first image and a second image with corresponding first and second regions, respectively (which Applicants do NOT concede) Pardas is completely silent regarding a similarity value between these two regions. That is, Pardas does not disclose or suggest "registering, by an image processing device, the first and second images by using a similarity value which relates to a similarity of a first region in the first image determined by the at least one first landmark and a second region in the second image determined by the at least one second landmark, *the registering including selecting at least one further first landmark in the first image and at least one further*

second landmark in the second image if the similarity value is less than a pre-selected value." Accordingly, Applicants respectfully request the withdrawal of the 35 U.S.C. § 102(b) of claim 1 and its dependent claim 10.

Independent claims 8 and 9 recite a similar limitation as described above for claim 1. Accordingly, the 35 U.S.C. §102(b) rejection of these claims should be withdrawn.

Claims 1 and 8-10 stand rejected under 35 U.S.C. §102(b) for being anticipated by Erdem et al. (U.S. Patent 5,982,909). Claim 1 is cited above.

Erdem discloses tracking a predetermined, 2D portion of an image throughout a sequence of images. (*See Erdem*, Abstract). Erdem uses a reference frame (14) with mesh elements (22) and nodes (23). (*Id.* at col. 3, l. 53 – col. 4, l. 32, Figs. 2-4). Subsequently, this reference mesh is mapped onto a current frame (114). A mesh (121) for the current frame is, thus, acquired with modified boundary elements (121) to properly fit the current frame. (*Id.* at col. 17, ll. 41-45, Fig. 20). Erdem discloses that "new inside and boundary nodes…are added to the mesh 121 half way on each link 140 that connect two nodes 123 in the mesh 121." (*Id.* at, col. 17, ll. 46-49). Next, hexagonal search and corner refinement (50) is conducted to further refine the mesh.

The Examiner refers to Erdem's addition of new inside and boundary nodes to meet the recitation of "*the registering including selecting at least one further first landmark in the first image and at least one further second landmark in the second image as a function of a pre-selected value of the similarity value*" in claim 1. Specifically, the Examiner states that the nodes in Fig. 20b which are not in Fig. 20a are equivalent to "*the registering including selecting at least one further first landmark in the first image*" and that the nodes in Fig. 20c which are not in Fig. 20b are equivalent to *at least one further second landmark in the second image as a function of a pre-selected value of the similarity value.*" Applicants respectfully disagree with the Examiner's interpretation of Erdem. As previously stated, the reference mesh shown in Fig. 20a is tracked into the

current frame (114), in which the current mesh (121) is obtained. (*See Erdem*, col. 17, ll. 41-45, Fig. 20). The new inside and boundary nodes (141) are added to this mesh in Fig. 20c. Subsequently, the position of the nodes (141) of the high-resolution mesh in Fig. 20c is refined and the result is shown in Fig. 20d. So, although new nodes are introduced in Fig. 20c, Fig. 20d does not show any new nodes not present in Fig. 20c, but rather the same nodes in different positions.

Although Erdem discloses that, after step 50 is performed using high-resolution nodes in the mesh (121), higher resolution nodes can be used and step 50 repeated, Erdem does not do this "*if the similarity value is less than a pre-selected value.*" The Examiner refers to the mean absolute difference (MAD) or mean square difference (MSE) to meet the pre-selected value of the similarity value. Applicants respectfully disagree. One of ordinary skill in the art would understand that a pre-selected value is a specific value (e.g. 1, 2, 3, etc.). It is respectfully submitted that Erdem does not disclose or suggest adding higher resolution nodes if the MAD or MSE "*is less than a pre-selected value,*" as recited in claim 1. Accordingly, Applicants respectfully request the withdrawal of the 35 U.S.C. § 102(b) of claim 1 and its dependent claim 10.

Independent claims 8 and 9 recite a similar limitation as described above for claim 1. Accordingly, the 35 U.S.C. §102(b) rejection of these claims should be withdrawn.

III.   THE 35 U.S.C. § 103(a) REJECTION SHOULD BE WITHDRAWN

Claim 7 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Erdem in view of Moshfeghi (U.S. Patent 5,633,951).

Applicants respectfully submit that Moshfegi fails to cure the above-mentioned deficiencies of Erdem and that Erdem and Moshfegi, alone or together, fail to disclose or suggest "the registering including selecting at least one further first landmark in the first image *and at least one further second landmark in the second image as a function of a pre-selected value of the similarity value,*" as recited in claim 1. Because claim 7

depends on and, therefore, contains all of the limitations of claim 1, the withdrawal of the 35 U.S.C. § 103(a) of claim 7 is respectfully requested.

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CONCLUSION

In light of the foregoing, Applicants respectfully submit that all of the presently pending claims are in condition for allowance. All issues raised by the Examiner having been addressed. An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

Dated: March 10, 2011   By:___/Michael J. Marcin/_____
                                              Michael J. Marcin (48,198)

                                              Fay Kaplun & Marcin, LLP
                                              150 Broadway, Suite 702
                                              New York, NY 10038
                                              Phone: 212-619-6000
                                              Fax: 212-619-0276